Chapter 3.9: Linear Approximation

Calculus I

College of the Atlantic. Fall 2016

1. Consider $f(x) = 1/x$.

   (a) Find the local linearization (aka tangent line approximation) to $f(x)$ at $x = 2$.

   (b) Use your approximation to estimate $f(2.1)$.

   (c) Make a very rough sketch $f(x)$ near $x = 2$.

   (d) Is your estimate too high or too low? Use a graph of $f(x)$ to support your reasoning.

2. Find the local linearization of $\sin(\theta)$ at $\theta = 0$.

3. Find the local linearization of $\cos(\theta)$ at $\theta = 0$.

4. Find the local linearization of e^{3x} at $x = 0$.

5. Let $g(x) = \sqrt{4 + 3x^2}$. Find the local linearization of $g(x)$ at $x = 3$.